

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Data Requirement: PMRA Data Code: 8.3.2.1, 8.3.2.2

EPA DP Barcode: 349858

OECD Data Point: IIIA 9.2.1

EPA Guideline: 835.6100

Test material:**Common name:** Saflufenacil.**Chemical name:****IUPAC name:** N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.**CAS name:** N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.
2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.**CAS No:** 372137-35-4.**Synonyms:** BAS 800 H, CL No. 433379, 4054449, AC 433,379.**SMILES string:** N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).**EPA Reviewer:** Greg Orrick
USEPA**Signature:**
Date:*Greg Orrick*
June 8, 2009**PMRA Reviewer:** Janine Glaser (1009)
HC-PMRA-EAD**Signature:**
Date: 2008 November 28*Janine Glaser***APVMA Reviewer:** Daryl Murphy
DEWHA/APVMA**Signature:**
Date:*D. Murphy***Company Code:** BAZ**Active Code:** SFF**Use Site Category:** 13 and 14**EPA PC Code:** 118203

CITATION: Gooding, R. and M. Saha. 2008. Freezer storage stability of BAS 800 H and the relevant metabolites in soil samples. Unpublished study performed by BASF Agro Research, Research Triangle Park, North Carolina; and sponsored and submitted by BASF Corporation, Research Triangle Park, North Carolina. BASF Study No.: 132671. BASF Registration Document No.: 2007/7013581. Experiment started January 18, 2007 and completed November 28, 2007 (p. 8). Final report issued January 4, 2008.



2083843

Data Evaluation Record on the stability of saflufenacil in soil

PMRA Submission Number {.....}

EPA MRID Number 47127837

Data Requirement: PMRA Data Code:
EPA DP Barcode: D349858
OECD Data Point:
EPA Guideline: Non-Guideline

Test material:

Common name: Saflufenacil.

Chemical name:

IUPAC name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.

CAS name: N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.
2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS No: 372137-35-4.

Synonyms: BAS 800 H, CL No. 433379, 4054449, AC 433,379.

SMILES string: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).


Primary Reviewer: Leanne Ganser
Cambridge Environmental

Signature: 
Date: 5/29/08

Secondary Reviewer: Joan Harlin
Cambridge Environmental

Signature: 
Date: 5/29/08

QC/QA Manager: Joan Gaidos
Cambridge Environmental

Signature: 
Date: 5/29/08

Final Reviewer: Greg Orrick
EPA Reviewer

Signature:
Date:

Company Code
Active Code
Use Site Category
EPA PC Code: 118203

CITATION: Gooding, R. and M. Saha. 2008. Freezer storage stability of BAS 800 H and the relevant metabolites in soil samples. Unpublished study performed by BASF Agro Research, Research Triangle Park, North Carolina; and sponsored and submitted by BASF Corporation, Research Triangle Park, North Carolina. BASF Study No.: 132671. BASF Registration

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

EXECUTIVE SUMMARY

The stability of saflufenacil (N'-{2-chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide) and its transformation products M800H01 (N-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide), M800H02 (N'-[2-chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide), M800H07 (N-{4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino}carbonyl]phenyl}-N'-methylurea), M800H08 (N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide), M800H15 (N-{4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino}carbonyl]phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide), and M800H22 (3-[(4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino}carbonyl]anilino}carbonyl(methyl)amino]-4,4,4-trifluorobutanoic acid) was determined in Georgia, Illinois, Manitoba, Arkansas, Washington, Ontario, and California soil samples (0-1 inch or 0-3 inch and 12-18 inch depths) that were fortified at 0.1 ppm and stored frozen for up to 9 months. Saflufenacil and its transformation products were fortified individually.

Storage stability results indicate that saflufenacil and the transformation products M800H01, M800H02, M800H07, M800H08, and M800H22 were stable in all seven soils (at both soil depths) for the 9-month study period. The transformation product M800H08 was stable in most soils (at both soil depths). The transformation product M800H08 may have declined slightly in the Illinois silt loam/silty clay loam soil and Washington loamy sand soil; however, a pattern of decline was not confirmed due to high sample variability. The transformation product M800H15 declined 40-103% after 9 months of storage, with recoveries of 5-84% at 9 months. M800H15 was not found in aerobic soil or aerobic aquatic studies, and was only found under anaerobic conditions or at pH 9 in a hydrolysis study.

Georgia soil samples. Corrected recoveries of saflufenacil, M800H01, M800H02, M800H07, M800H08, and M800H22 (0-3 and 12-18 inch depths) ranged from 97-122%, 90-122%, 94-107%, 104-123%, 75-111%, and 98-149%, respectively, with no pattern of decline over the 9-month study period. Corrected recoveries of the transformation product M800H15 (both depths) were initially 99-121%, decreased to 68-80% at 1 month, and were 54-74% at 6-9 months.

Illinois soil samples. Corrected recoveries of saflufenacil, M800H01, M800H02, M800H07, M800H08, and M800H22 (0-3 and 12-18 inch depths) ranged from 85-131%, 70-120%, 86-125%, 91-131%, 61-163%, and 94-124%, respectively, with no pattern of decline over the 9-month study period. Corrected recoveries of the transformation product M800H15 (both depths) were initially 98-108%, and decreased to 23-59% at 1-6 months and 14-16% at 9 months.

Manitoba soil samples. Corrected recoveries of saflufenacil, M800H01, M800H02, M800H07, M800H08, and M800H22 (0-3 and 12-18 inch depths) ranged from 83-114%, 93-142%, 84-112%, 89-137%, 77-125%, and 93-136%, respectively, with no pattern of decline over the 9-

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876
PMRA Submission Number 2008-0430

EPA MRID Number 47128237

month study period. Corrected recoveries of the transformation product M800H15 (0-3 inch depth) were initially 86%, and decreased to 59-63% at 1-3 months and 28-31% at 6-9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 127%, and decreased to 106% at 1 month and 74-84% at 3-9 months.

Arkansas soil samples. Corrected recoveries of saflufenacil, M800H01, M800H02, M800H07, M800H08, and M800H22 (0-3 and 12-18 inch depths) ranged from 74-119%, 79-108%, 83-109%, 89-118%, 64-141%, and 101-141%, respectively, with no pattern of decline over the 9-month study period. Corrected recoveries of the transformation product M800H15 (0-3 inch depth) were initially 106%, and decreased to 72-76% at 1-6 months and 57% at 9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 102%, and decreased to 67% at 1 month, 28% at 6 months, and 18% at 9 months.

Washington soil samples. Corrected recoveries of saflufenacil, M800H01, M800H02, M800H07, and M800H22 (0-3 and 12-18 inch depths) ranged from 69-114%, 89-145%, 71-113%, 92-144%, and 80-155%, respectively, with no pattern of decline over the 9-month study period. Corrected recoveries of the transformation product M800H08 (both depths) were initially 109-122%, and, at 1 month, 106-107%. Thereafter, corrected recoveries of M800H08 were 60-87% at 3-9 months. Whether the decline in recoveries indicates a pattern of decline is uncertain due to sample variability. Corrected recoveries of the transformation product M800H15 (0-3 inch depth) were initially 91%, and decreased to 73% at 1 month, 62% at 3 months, 30% at 6 months, and 21% at 9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 78%, 73-114% at 1-3 months, and 40-47% at 6-9 months.

Ontario soil samples. Corrected recoveries of saflufenacil, M800H01, M800H02, M800H07, M800H08, and M800H22 (0-3 and 12-18 inch depths) ranged from 74-114%, 79-124%, 87-136%, 96-152%, 62-118%, and 87-148%, respectively, with no pattern of decline over the 9-month study period. Corrected recoveries of the transformation product M800H15 (0-3 inch depth) were initially 109%, and decreased to 67% at 1 month, 34% at 6 months, and 24% at 9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 108%, and decreased to 56% at 1 month, 20% at 6 months, and 5% at 9 months.

California soil samples. Corrected recoveries of saflufenacil, M800H01, M800H02, M800H07, M800H08, and M800H22 (0-1 and 12-18 inch depths) ranged from 97-139%, 90-119%, 84-118%, 94-145%, 78-111%, and 86-119%, respectively, with no pattern of decline over the 9-month study period. Corrected recoveries of the transformation product M800H15 (0-1 inch depth) were initially 99%, and decreased to 68% at 1 month, 29% at 6 months, and 25% at 9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 126%, and decreased to 68% at 1 month, 48% at 6 months, and 41% at 9 months.

Study Acceptability: This study is classified **acceptable/fully reliable**. No significant deviations from good scientific practices were noted.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876
PMRA Submission Number 2008-0430

EPA MRID Number 47128237

MATERIALS AND METHODS

Untreated soil samples obtained from five U.S. saflufenacil terrestrial field dissipation field sites located in Georgia, Illinois, Arkansas, Washington, and California, and from two Canadian saflufenacil terrestrial field dissipation field sites located in Manitoba and Ontario, were used in the study (p. 9). Soil samples were collected from 0-1 or 0-3 inch depths and 12-18 inch depths (Reviewer's Comment #2).

Properties of the soil (0-6 inch depth).

Property	Georgia	Illinois	Manitoba	Arkansas	Washington	Ontario	California
Textural classification (USDA)	Loamy sand	Silt loam	Loam	Silt loam	Loamy sand	Loam	Loam
% Sand	79	6.5	47	26	82	43	45
% Silt	12	77.3	38	56	16	44	28
% Clay	9	16.2	15	18	2	13	27
pH	6.2	5.54	8.2	6.6	7.6	7.5	7.4
Organic matter	1.0	2.86	5.6	1.3	1.0	2.5	1.3
Total organic carbon (%)	0.6 ¹	1.7 ¹	3.3	0.8	0.6	1.5	0.8
CEC (meq/100 g)	5.5	14.7	25.4	10.4	6.5	11.3	13.4
Moisture at 1/3 bar (%)	7.2	24.6	39.0	21.5	9.0	20.5	24.4
Moisture at 15 bar (%)	3.3	18.1	25.2	8.3	4.5	8.1	12.6
Bulk density (g/cm ³)	1.47	2.53	1.04	--	1.37	1.27	1.28

Data were obtained from Appendix D, pp. 275-289 of the study report.

1 Reviewer-calculated using the formula: organic carbon (%) = organic matter (%) ÷ 1.72.

--: Not reported.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Properties of the soil (12-18 inch depth).

Property	Georgia	Illinois	Manitoba	Arkansas	Washington	Ontario	California
Textural classification (USDA)	Sandy loam	Silty clay loam	Clay loam	Loam	Loamy sand	Loam	Clay loam
% Sand	77	5.8	39	30	82	39	43
% Silt	8	66.4	32	44	16	46	28
% Clay	15	27.8	29	26	2	15	29
pH	5.8	3.88	8.8	6.8	8.3	7.9	7.4
Organic matter	0.3	1.72	0.9	0.9	0.3	0.5	1.0
Total organic carbon (%)	0.2 ¹	1.0 ¹	0.5	0.5	0.2	0.3	0.6
CEC (meq/100 g)	4.9	19.6	12.0	19.5	7.6	6.3	20.4
Moisture at 1/3 bar (%)	7.7	25.8	26.7	34.8	8.2	19.8	25.1
Moisture at 15 bar (%)	4.3	20.3	17.3	18.8	4.8	8.4	13.8
Bulk density (g/cm ³)	1.44	2.29	1.12	--	1.46	1.29	1.26

Data were obtained from Appendix D, pp. 275-289 of the study report.

1 Reviewer-calculated using the formula: organic carbon (%) = organic matter (%) ÷ 1.72.

--: Not reported.

Soil samples (100 ± 10 mg) were individually fortified at 0.1 ppm with saflufenacil (BAS 800 H) and the transformation products (pp. 9-12, 14):

- M800H01 [N-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide],
- M800H02 [N'-[2-chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide],
- M800H07 [N-{4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)carbonyl]phenyl}-N'-methylurea],
- M800H08 [N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-n-methylsulfamide],
- M800H15 [N-{4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)carbonyl]phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide], and
- M800H22 [3-[(4-chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)carbonyl]anilino)carbonyl](methyl)amino]-4,4,4-trifluorobutanoic acid; chemical names obtained from Table 1, p. 27 of Ta, 2007 (MRID 47127825)].

Five samples collected at each sampling interval were analyzed for the parent and transformation products. Each analytical set consisted of one unfortified control sample, two stored fortifications, and two fresh fortifications to determine concurrent recoveries. The fresh fortifications were prepared at the same concentration as the stored fortifications. Samples were

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

stored frozen (-30 to 0°C) for 0, 1, 3 (Manitoba and Washington soils only), 6, and 9 months prior to analysis (pp. 9, 14).

Samples were extracted sequentially by shaking once with acetonitrile (0.3 mL), once with acetonitrile:water (40:60, v:v; 0.3 mL), and once with methanol:water (80:20, v:v; 0.4 mL; p. 14; Figure 1, p. 20; Appendix B, pp. 259-262). The extracts were combined and analyzed directly using LC/MS/MS (Phenomenex Columbus C18 100 x 2.1 mm column, 5 μ particle size) in the positive ion ionization mode using a gradient mobile phase of A) water with 0.1% formic acid and 4 mM ammonium formate and B) methanol with 0.1% formic acid and 4 mM ammonium formate (A:B, 95:5 to 20:80 to 95:5, v:v), and a flow rate of 400 μ L/minute (Appendix B, pp. 262-264). Expected retention times were 3.26 minutes for saflufenacil, 3.21 minutes for M800H01, 3.23 minutes for M800H02, 3.10 minutes for M800H07, 3.26 minutes for M800H08, 3.14 minutes for M800H15, and 3.21 minutes for M800H022. The LOQ was 0.01 ppm for each analyte (Appendix B, p. 265). The limit of detection was set at 20% of the limit of quantitation. Residue concentrations were calculated using calibration curves created with the following analytical standards (Appendix A, Figures A.42-A.48, pp. 239-245):

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Reference compounds.

Applicants Code Name	CAS Number	Chemical Name	Chemical Formula	Molecular Weight (g/mol)	Purity (%)	Lot No.
BAS 800 H (saflufenacil)	372137-35-4	N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide	$C_{17}H_{17}ClF_4N_4O_5S$	500.9	99.9	L67-140
M800H01	--	N-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide	$C_{16}H_{15}ClF_4N_4O_5S$	486.8	98.8	L74-62
M800H02	--	N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide	$C_{16}H_{15}ClF_4N_4O_5S$	486.8	99.2	L67-186
M800H07	--	N-{4-Chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)carbonyl]-phenyl}-N'-methylurea	$C_{13}H_{18}ClFN_4O_4S$	380.8	95.4	L67-196
M800H08	--	N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-n-methylsulfamide	$C_{17}H_{19}ClF_4N_4O_5S$	502.9	97.2	L74-66
M800H15	--	N-{4-Chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)carbonyl]-phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide	$C_{15}H_{18}ClF_4N_3O_6$	479.9	94.5	L74-80
M800H22	--	3-[(4-Chloro-2-fluoro-5-[(isopropyl(methyl)amino)sulfonyl]amino)carbonyl]-anilino)carbonyl(methyl)-amino]-4,4,4-trifluorobutanoic acid	$C_{17}H_{21}ClF_4N_4O_6S$	520.9	94.1	L74-56

Data were obtained from pp. 10-12; Appendix B, pp. 250-253 of the study report. Chemical names were obtained from Table 1, p. 27 of Ta, 2007 (MRID 47127825).

--: Not reported.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876
PMRA Submission Number 2008-0430

EPA MRID Number 47128237

RESULTS AND DISCUSSION

Storage stability results indicate that saflufenacil and the transformation products M800H01, M800H02, M800H07, M800H08, and M800H22 were stable in all seven soils (at both soil depths) for the 9-month study period. The transformation product M800H08 may have declined slightly in the Illinois silt loam/silty clay loam soil and Washington loamy sand soil; however, a pattern of decline was not confirmed due to high sample variability. The transformation product M800H15 declined 40-103% after 9-months storage, with recoveries of 5-84% at 9 months.

The study authors reported that the transformation product M800H15 is of limited relevance to soil under any conditions, and especially not relevant under the typical aerobic to weakly anaerobic conditions likely to be found in a field (p. 17). M800H15 was not found in aerobic soil or aerobic aquatic studies, and was only found under anaerobic conditions or at pH 9 in a hydrolysis study.

Georgia soil samples. Corrected recoveries of saflufenacil (both depths) were initially 97-108%, and ranged from 99-122% from 1 to 9 months, with no pattern of decline (Table IX, p. 167). Corrected recoveries of the transformation product M800H01 (both depths) were initially 101-122%, and ranged from 93-98% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H02 (both depths) were initially 102-104%, and ranged from 94-107% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H07 (both depths) were initially 104-107%, and ranged from 104-123% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H08 (both depths) were initially 89-111%, and ranged from 75-110% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H22 (both depths) were initially 121-149%, and ranged from 98-128% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H15 (both depths) were initially 99-121%, decreased to 68-80% at 1 month, and were 54-74% at 6 months and 59-65% at 9 months.

Illinois soil samples. Corrected recoveries of saflufenacil (both depths) were initially 111-131% and ranged from 85-117% from 1 to 9 months, with no pattern of decline (Table IX, p. 168). Corrected recoveries of the transformation product M800H01 (both depths) were initially 117-120%, and ranged from 70-111% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H02 (both depths) were initially 107-125%, and ranged from 86-118% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H07 (both depths) were initially 118-120%, and ranged from 91-131% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H08 (both depths) were initially 77-143%, and ranged from 112-163% at 1 month and 61-87 at 6-9 months. Corrected recoveries of the transformation product M800H22 (both depths) were initially 116-120%, and ranged from 94-124% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H15 (both depths) were initially 98-108%, decreased to 35-50% at 1 month, and were 23-59% at 6 months and 14-16% at 9 months.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Manitoba soil samples. Corrected recoveries of saflufenacil (both depths) were initially 91-105%, and ranged from 83-114% from 1 to 9 months, with no pattern of decline (Table IX, p. 168). Corrected recoveries of the transformation product M800H01 (both depths) were initially 94-121%, and ranged from 93-142% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H02 (both depths) were initially 102-112%, and ranged from 84-110% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H07 (both depths) were initially 91-137%, and ranged from 89-132% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H08 (both depths) were initially 107-125%, and ranged from 77-115% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H22 (both depths) were initially 130-136%, and ranged from 93-130% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H15 (0-3 inch depth) were initially 86%, and decreased to 59-63% at 1-3 months and 28-31% at 6-9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 127%, decreased to 74-79% 3-6 months, and were 84% at 9 months.

Arkansas soil samples. Corrected recoveries of saflufenacil (both depths) were initially 90-119%, and ranged from 74-115% from 1 to 9 months, with no pattern of decline (Table IX, p. 165). Corrected recoveries of the transformation product M800H01 (both depths) were initially 93-107%, and ranged from 79-108% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H02 (both depths) were initially 91-98%, and ranged from 83-109% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H07 (both depths) were initially 89-114%, and ranged from 90-118% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H08 (both depths) were initially 98-141%, and ranged from 64-117% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H22 (both depths) were initially 131-141%, and ranged from 101-114% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H15 (0-3 inch depth) were initially 106%, and decreased to 72-76% at 1-6 months and 57% at 9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 102%, and decreased to 67% 1 month, 28% at 6 months, and 18% at 9 months.

Washington soil samples. Corrected recoveries of saflufenacil (both depths) were initially 96-106%, and ranged from 69-114% from 1 to 9 months, with no pattern of decline (Table IX, p. 171). Corrected recoveries of the transformation product M800H01 (both depths) were initially 115-145%, and ranged from 89-139% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H02 (both depths) were initially 101-107%, and ranged from 71-113% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H07 (both depths) were initially 113-123%, and ranged from 92-144% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H08 (both depths) were initially 109-122%, were 106-107% at 1 month, and ranged from 60-87% from 3 to 9 months. Whether the decline in recoveries

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

following 1 month indicates a pattern of decline is uncertain due to sample variability. Corrected recoveries of the transformation product M800H22 (both depths) were initially 128-134%, and ranged from 80-155% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H15 (both soil depths) were initially 78-91%, were 73-114% at 1 month, and decreased to 62-73% at 3 months and 21-47% at 6-9 months.

Ontario soil samples. Corrected recoveries of saflufenacil (both depths) were initially 97-111%, and ranged from 74-114% from 1 to 9 months, with no pattern of decline (Table IX, p. 170). Corrected recoveries of the transformation product M800H01 (both depths) were initially 101-111%, and ranged from 79-124% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H02 (both depths) were initially 101-120%, and ranged from 87-136% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H07 (both depths) were initially 113-126%, and ranged from 96-152% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H08 (both depths) were initially 110-114%, and ranged from 62-118% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H22 (both depths) were initially 130-148%, and ranged from 90-138% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H15 (0-3 inch depth) were initially 109%, and decreased to 67% at 1 month, 34% at 6 months, and 24% at 9 months. Corrected recoveries of the transformation product M800H15 (12-18 inch depth) were initially 108%, and decreased to 56% at 1 month, 20% at 6 months, and 5% at 9 months.

California soil samples. Corrected recoveries of saflufenacil (both depths) were initially 113-139%, and ranged from 97-104% from 6 to 9 months, with no pattern of decline (Table IX, p. 166). Corrected recoveries of the transformation product M800H01 (both depths) were initially 102-109%, and ranged from 90-119% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H02 (both depths) were initially 110-118%, and ranged from 84-100% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H07 (both depths) were initially 114-145%, and ranged from 94-120% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H08 (both depths) were initially 86-108%, and ranged from 78-111% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H22 (both depths) were initially 113-119%, and ranged from 86-114% from 1 to 9 months, with no pattern of decline. Corrected recoveries of the transformation product M800H15 (both soil depths) were initially 99-126%, decreased to 68% at 1 month, and were 25-48% at 6-9 months.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Mean corrected recoveries of saflufenacil and its transformation products from Georgia soil samples.

Analyte	Soil depth (inches)	Months Posttreatment			
		0	1	6	9
Saflufenacil	0-3	108	107	99	111
	12-18	97	122	112	108
M800H01	0-3	122	98	90	94
	12-18	101	93	93	96
M800H02	0-3	104	97	98	94
	12-18	102	97	107	102
M800H07	0-3	104	108	123	121
	12-18	107	104	111	123
M800H08	0-3	111	89	107	97
	12-18	89	110	75	96
M800H15	0-3	121	80	54	65
	12-18	99	68	74	59
M800H22	0-3	121	119	125	98
	12-18	149	128	115	100

Data were obtained from Table III, pp. 54-68; Table IX, p. 167 of the study report.

Mean corrected recoveries of saflufenacil and its transformation products from Illinois soil samples.

Analyte	Soil depth (inches) ¹	Months Posttreatment			
		0	1	6	9
Saflufenacil	0-3	131	95	85	117
	12-18	111	116	85	109
M800H01	0-3	117	106	70	94
	12-18	120	111	87	101
M800H02	0-3	107	96	86	118
	12-18	125	105	104	116
M800H07	0-3	120	98	91	107
	12-18	118	98	91	131
M800H08	0-3	77	112	61	82
	12-18	143	163	70	87
M800H15	0-3	108	35	23	14
	12-18	98	50	59	16
M800H22	0-3	120	103	94	103
	12-18	116	124	104	121

Data were obtained from Table IV, pp. 69-84; Table IX, p. 168 of the study report.

¹ First soil depth reported as 0-1 inch in Table IX, p. 168 of the study report (Reviewer's Comment #2).

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Mean corrected recoveries of saflufenacil and its transformation products from Manitoba soil samples.

Analyte	Soil depth (inches)	Months Posttreatment				
		0	1	3	6	9
Saflufenacil	0-3	91	83	94	90	95
	12-18	105	114	83	97	104
M800H01	0-3	94	93	121	130	104
	12-18	121	142	105	102	130
M800H02	0-3	102	84	102	86	110
	12-18	112	95	88	86	105
M800H07	0-3	91	89	95	113	132
	12-18	137	119	103	113	125
M800H08	0-3	107	105	78	96	81
	12-18	125	115	77	96	97
M800H15	0-3	86	63	59	28	31
	12-18	127	108	74	79	84
M800H22	0-3	130	119	100	95	114
	12-18	136	130	93	101	116

Data were obtained from Table V, pp. 85-106; Table IX, p. 169 of the study report.

Mean corrected recoveries of saflufenacil and its transformation products from Arkansas soil samples.

Analyte	Soil depth (inches)	Months Posttreatment			
		0	1	6	9
Saflufenacil	0-3	90	74	102	100
	12-18	119	95	88	115
M800H01	0-3	107	79	85	85
	12-18	93	108	87	89
M800H02	0-3	98	90	83	105
	12-18	91	109	86	102
M800H07	0-3	114	93	107	90
	12-18	89	118	94	114
M800H08	0-3	98	64	104	84
	12-18	141	117	64	98
M800H15	0-3	106	72	76	57
	12-18	102	67	28	18
M800H22	0-3	131	110	112	111
	12-18	141	111	101	114

Data were obtained from Table I, pp. 25-39; Table IX, p. 165 of the study report.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876
PMRA Submission Number 2008-0430

EPA MRID Number 47128237

Mean corrected recoveries of saflufenacil and its transformation products from Washington soil samples.

Analyte	Soil depth (inches) ¹	Months Posttreatment				
		0	1	3	6	9
Saflufenacil	0-3	96	94	94	69	95
	12-18	106	114	100	78	97
M800H01	0-3	115	110	120	89	139
	12-18	145	120	113	101	92
M800H02	0-3	101	88	97	71	107
	12-18	107	113	94	80	96
M800H07	0-3	123	99	137	92	123
	12-18	113	131	129	93	144
M800H08	0-3	109	106	81	60	72
	12-18	122	107	79	87	83
M800H15	0-3	91	73	62	30	21
	12-18	78	114	73	40	47
M800H22	0-3	134	127	117	80	105
	12-18	128	155	128	92	113

Data were obtained from Table VII, pp. 122-143; Table IX, p. 171 of the study report.

1 First soil depth reported as 0-1 inch on p. 9 and Table VII, pp. 122-128 of the study report.

Mean corrected recoveries of saflufenacil and its transformation products from Ontario soil samples.

Analyte	Soil depth (inches) ¹	Months Posttreatment			
		0	1	6	9
Saflufenacil	0-3	111	94	83	104
	12-18	97	91	74	114
M800H01	0-3	101	109	79	94
	12-18	111	103	83	124
M800H02	0-3	101	104	89	113
	12-18	120	98	87	136
M800H07	0-3	126	106	96	98
	12-18	113	103	102	152
M800H08	0-3	110	62	97	76
	12-18	114	118	90	111
M800H15	0-3	109	67	34	24
	12-18	108	56	20	5
M800H22	0-3	130	118	90	101
	12-18	148	112	87	138

Data were obtained from Table VI, pp. 107-121; Table IX, p. 170 of the study report.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876
PMRA Submission Number 2008-0430

EPA MRID Number 47128237

Mean corrected recoveries of saflufenacil and its transformation products from California soil samples.

Analyte	Soil depth (inches)	Months Posttreatment			
		0	1	6	9
Saflufenacil	0-1	113	NA	98	97
	12-18	139	NA	104	100
M800H01	0-1	102	105	90	96
	12-18	109	109	90	119
M800H02	0-1	118	96	84	100
	12-18	110	85	89	100
M800H07	0-1	114	104	103	120
	12-18	145	104	94	114
M800H08	0-1	86	111	83	90
	12-18	108	111	78	97
M800H15	0-1	99	68	29	25
	12-18	126	68	48	41
M800H22	0-1	119	112	86	114
	12-18	113	102	101	101

Data were obtained from Table II, pp. 40-53; Table IX, p. 166 of the study report.

STUDY DEFICIENCIES

No significant deviations from good scientific practices were noted.

REVIEWER'S COMMENTS

1. Signed and dated Data Confidentiality, GLP, and Certification of Authenticity statements were provided (pp. 2-3, 5). A signed (not dated) Quality Assurance statement was provided (p. 4).
2. The study authors reported that soil samples were collected from Georgia, Illinois, Manitoba, and Arkansas at the 0-3 inch and 12-18 inch depths, and from Washington, Ontario, and California at the 0-1 inch and 12-18 inch depths (p. 9). However, conflicting information for the Illinois, Washington, and Ontario soils is presented in the study report data tables. The soil depth for Illinois is reported as 0-1 inch in Table IX, p. 168 and as 0-3 inch in Table IV, pp. 69-84 of the study report. The soil depth for the Washington soil is reported as 0-1 inch in Table VII, pp. 122-128 and as 0-3 inch in Table VII, pp. 129-143 and Table IX, p. 171 of the study report. The soil depth for the Ontario soil is reported as 0-3 inch in both Table VI, pp. 107-121 and Table IX, p. 170 of the study report.
3. Select recovery values reported in Tables I-VII (pp. 25-143) conflict with those reported in the summary Table IX (pp. 165-171). It is unclear which values are correct. Values from the recovery data tables (Tables I-VII) were used in this review where they differed from values reported in the summary table.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

4. A plot history of the test soils, including a crop history and prior pesticide and fertilizer use, was not provided.
5. The recoveries from fresh fortifications analyzed with the stored fortifications are provided in the table below:

Mean recoveries of saflufenacil and its transformation products from fresh fortifications (mean \pm sd).

Soil Location	Analyte	Months Posttreatment	
		0-6	9
Georgia	Saflufenacil	100 \pm 15.0	111 \pm 9.8
	M800H01	102 \pm 13.5	107 \pm 3.9
	M800H02	107 \pm 11.1	112 \pm 5.9
	M800H07	107 \pm 14.4	102 \pm 6.4
	M800H08	104 \pm 20.1	111 \pm 5.4
	M800H15	100 \pm 7.4	102 \pm 1.9
	M800H22	102 \pm 9.8	116 \pm 3.3
Illinois	Saflufenacil	106 \pm 19.7	90 \pm 6.3
	M800H01	106 \pm 13.6	91 \pm 5.4
	M800H02	106 \pm 14.4	89 \pm 8.3
	M800H07	105 \pm 11.1	85 \pm 4.6
	M800H08	113 \pm 25.9	95 \pm 10.0
	M800H15	105 \pm 13.1	88 \pm 5.9
	M800H22	105 \pm 11.2	89 \pm 10.6
Manitoba	Saflufenacil	105 \pm 11.8	93 \pm 8.6
	M800H01	104 \pm 11.8	88 \pm 4.6
	M800H02	111 \pm 11.7	96 \pm 17.6
	M800H07	109 \pm 12.8	97 \pm 10.9
	M800H08	99 \pm 18.4	102 \pm 5.4
	M800H15	107 \pm 11.2	98 \pm 10.8
	M800H22	105 \pm 15.7	93 \pm 7.0
Arkansas	Saflufenacil	119 \pm 15.0	91 \pm 4.6
	M800H01	118 \pm 9.8	94 \pm 6.6
	M800H02	119 \pm 10.0	98 \pm 5.9
	M800H07	119 \pm 12.7	96 \pm 7.0
	M800H08	115 \pm 25.8	101 \pm 6.3
	M800H15	107 \pm 17.9	97 \pm 5.8
	M800H22	111 \pm 11.3	96 \pm 6.7
Washington	Saflufenacil	110 \pm 27.2	124 \pm 10.8
	M800H01	114 \pm 21.8	121 \pm 13.6
	M800H02	114 \pm 20.2	121 \pm 11.5
	M800H07	114 \pm 21.3	124 \pm 6.6
	M800H08	103 \pm 31.0	120 \pm 5.7
	M800H15	115 \pm 15.4	121 \pm 9.5
	M800H22	109 \pm 22.6	116 \pm 9.2

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Soil Location	Analyte	Months Posttreatment	
		0-6	9
Ontario	Saflufenacil	119 ± 16.7	102 ± 12.6
	M800H01	115 ± 12.0	104 ± 7.9
	M800H02	118 ± 11.4	107 ± 10.2
	M800H07	116 ± 15.4	103 ± 11.6
	M800H08	104 ± 10.8	99 ± 21.3
	M800H15	115 ± 13.4	94 ± 5.0
	M800H22	109 ± 12.7	98 ± 7.4
California	Saflufenacil	111 ± 15.4	99 ± 3.9
	M800H01	113 ± 7.6	96 ± 7.5
	M800H02	117 ± 9.5	101 ± 4.4
	M800H07	113 ± 4.1	97 ± 5.0
	M800H08	111 ± 16.9	103 ± 8.3
	M800H15	112 ± 11.4	98 ± 3.8
	M800H22	119 ± 12.8	102 ± 5.0

Data were obtained from Table X, pp. 172-173 of the study report.

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Attachment 1: Structures of Parent Compound and Transformation Products

Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Saflufenacil [BAS 800 H, CL No. 433379, 4054449, AC 433,379]

IUPAC Name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.

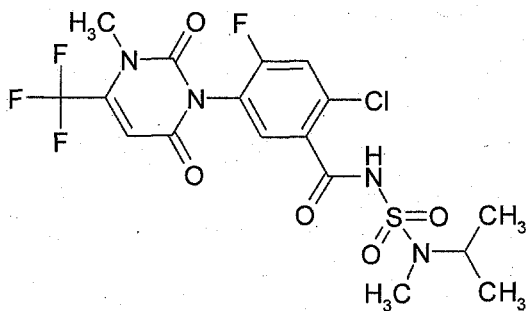
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

CAS Name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.

CAS Number: 372137-35-4.

SMILES String: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).

Empirical formula: C₁₇H₁₇ClF₄N₄O₅S **Molecular formula:** C₁₇H₁₇ClF₄N₄O₅S



Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

Identified Compounds

Data Evaluation Record on the storage stability of saflufenacil in soil

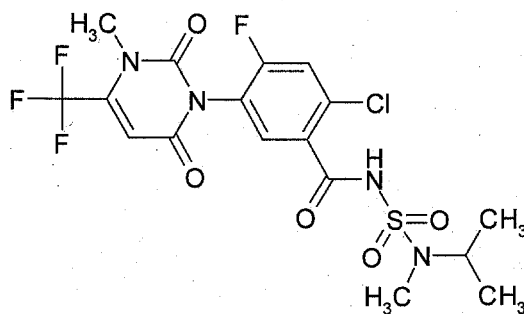
PMRA Document Number 1546876

EPA MRID Number 47128237

PMRA Submission Number 2008-0430

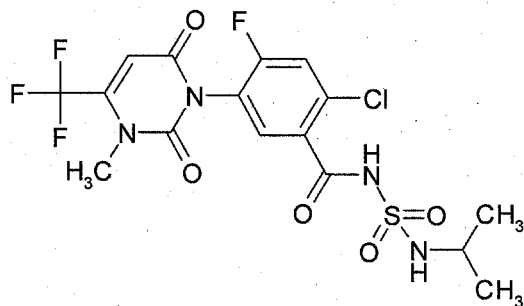
Saflufenacil [BAS 800 H, CL No. 433379, 4054449, AC 433,379]

IUPAC Name: N'-{2-Chloro-4-fluoro-5-[1,2,3,6-tetrahydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)pyrimidin-1-yl]benzoyl}-N-isopropyl-N-methylsulfamide.
N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.
CAS Name: 2-Chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2H)-pyrimidinyl]-4-fluoro-N-[[methyl(1-methylethyl)amino]sulfonyl]benzamide.
CAS Number: 372137-35-4.
SMILES String: N1(C)C(C(F)(F)F)=CC(=O)N(C2=CC(C(=O)NS(=O)(=O)N(C)C(C)C)=C(Cl)C=C2F)C1=O (EPI Suite v3.12 SMILES string from ISIS .MOL).
Empirical formula: C₁₇H₁₇ClF₄N₄O₅S **Molecular formula:** C₁₇H₁₇ClF₄N₄O₅S



M800H01 [4118561]

IUPAC Name: N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N'-isopropylsulfamide.
CAS Name: Not reported.
CAS Number: Not reported.



Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

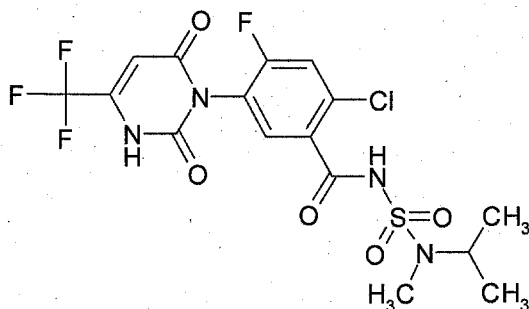
PMRA Submission Number 2008-0430

M800H02 [4118416]

IUPAC Name: N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydropyrimidin-1(2H)-yl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide.
N'-[2-Chloro-5-(2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)-4-fluorobenzoyl]-N-isopropyl-N-methylsulfamide.

CAS Name: Not reported.

CAS Number: Not reported.

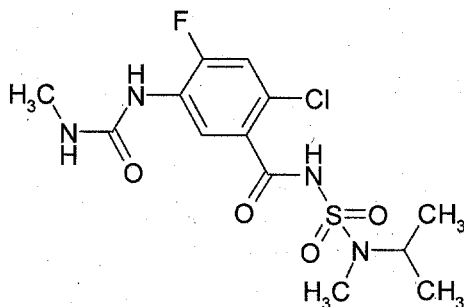


M800H07 [4775453]

IUPAC Name: N-{4-Chloro-2-fluoro-5-[[([isopropyl(methyl)amino)sulfonyl]amino)carbonyl]phenyl}-N'-methylurea.

CAS Name: Not reported.

CAS Number: Not reported.



Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876

EPA MRID Number 47128237

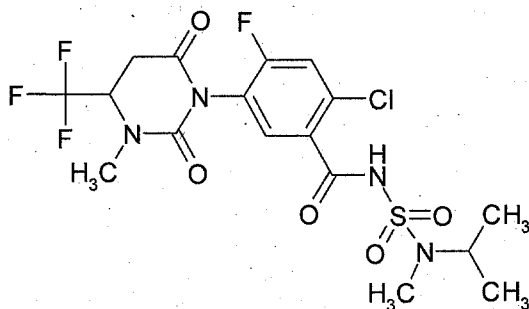
PMRA Submission Number 2008-0430

M800H08 [4773881]

IUPAC Name: N'-[2-Chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)tetrahydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide.

CAS Name: Not reported.

CAS Number: Not reported.

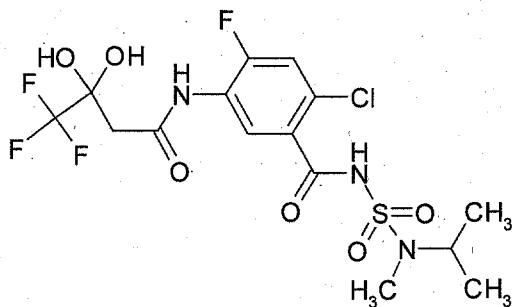


M800H15 [M800H15-ketohydrate, "Ketohydrate", 5264357]

IUPAC Name: N-{4-Chloro-2-fluoro-5-[[({[isopropyl(methyl)amino]sulfonyl}amino)carbonyl]phenyl}-4,4,4-trifluoro-3,3-dihydroxybutanamide.

CAS Name: Not reported.

CAS Number: Not reported.



Data Evaluation Record on the storage stability of saflufenacil in soil

PMRA Document Number 1546876
PMRA Submission Number 2008-0430

EPA MRID Number 47128237

M800H22 [5216337]

IUPAC Name: 3-[(4-Chloro-2-fluoro-5-
[[[isopropyl(methyl)amino]sulfonyl]amino]carbonyl]anilino)carbonyl](methylamino)-4,4,4-trifluorobutanoic acid.

CAS Name: Not reported.

CAS Number: Not reported.

